

**PATENT**Docket No.: FR010012  
Customer No. 000024737**REMARKS**

By this amendment, claims 1-10 have been amended. Claims 1-11 remain in the application. This application has been carefully considered in connection with the Examiner's Action. Reconsideration, and allowance of the application, as amended, is respectfully requested.

**The Specification**

By this amendment, the abstract has been amended to correct grammatical errors and place the same in better form.

**Rejection under 35 U.S.C. § 112**

Claims 1-11 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. By this amendment, claims 1-10 have been amended to clarify the same and to provide proper antecedent basis for the elements of the respective claims. Claims 1-11 are now believed allowable. Accordingly, the rejection of claims 1-11 should be withdrawn.

**Rejection under 35 U.S.C. § 103****Claim 1**

Claim 1 recites a method of manufacturing an ultrasound transducer, comprising: providing a plate shaped as a disc and formed of a composite piezoelectric material; cutting the plate to form at least one slit in the plate, wherein the at least one slit has a radial orientation and extends from a peripheral edge of the disc towards its center, further wherein the at least one slit includes two facing, oppositely situated free edges which bound the slit; and forming the plate into a hollow spherical cap by deformation, wherein the two facing, oppositely situated free edges which bound the slit are substantially in contact with one another so as to minimize internal stresses in the cap

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caused by the deformation.

Claims 1-7, 10 and 11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Lockwood et al. (5,412,854) in view of Kensaku et al. (Japanese Publication 05-276594).

Applicant traverses this rejection on the grounds that these references are defective in establishing a prima facie case of obviousness with respect to claim 1.

As the PTO recognizes in MPEP § 2142:

*... The examiner bears the initial burden of factually supporting any prima facie conclusion of obviousness. If the examiner does not produce a prima facie case, the applicant is under no obligation to submit evidence of nonobviousness...*

It is submitted that, in the present case, the examiner has not factually supported a prima facie case of obviousness for at least the following, mutually exclusive, reasons.

**1. Even When Combined, the References Do Not Teach the Claimed Subject Matter**

The Lockwood and Kensaku references cannot be applied to reject claim 1 under 35 U.S.C. § 103 which provides that:

*A patent may not be obtained ... if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains ...*  
(Emphasis added)

Thus, when evaluating a claim for determining obviousness, all limitations of the claim must be evaluated. However, since neither Lockwood nor Kensaku teaches manufacturing an ultrasound transducer by providing a plate shaped as a disc and formed of a composite piezoelectric material; cutting the plate to form at least one slit in

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the plate, the slit includes two facing, oppositely situated free edges which bound the slit; and forming the plate into a hollow spherical cap by deformation, *wherein the two facing, oppositely situated free edges which bound the slit are substantially in contact with one another so as to minimize internal stresses in the cap caused by the deformation*, as is claimed in claim 1, it is impossible to render the subject matter of claim 1 as a whole obvious, and the explicit terms of the statute cannot be met.

In contrast, Lockwood teaches providing a wafer of piezoelectric material 12, electrode layers (15,17), and a metal sheet (20) applied to a thin adhesive layer 18 that is applied to a back face (16) of wafer (12), wherein "[b]y bonding the metal backing layer onto the wafer, stresses which are created when the transducer is pressed into the well are evenly distributed across the surface of the material" and local concentrations of stress are avoided. Accordingly, Lockwood requires a metal sheet to evenly distribute stresses. Lockwood also teaches a composite wafer that requires the piezoelectric material, the electrode layers, and the metal sheet as opposed to a "*composite piezoelectric material*" as required in claim 1 of the present application.

Kensaku, on the other hand, teaches an ultrasound wave transmitter-receiver for obstruction detection, range measurement, etc., operating in the *kHz* range as opposed to operation in the *MHz* range of the present claimed embodiments. Kensaku discloses a piezoelectric vibrator with slits to reduce a resonance frequency of the spread vibration and increase a sound pressure level of an ultrasound wave, further by adhering the piezoelectric vibrator to a diaphragm. Still further, Kensaku discloses making the ultrasonic wave reach up to a long or far distance, further in connection with a *supersonic* wave. (Kensaku, Abstract).

Thus, for this mutually exclusive reason, the examiner's burden of factually supporting a *prima facie* case of obviousness has clearly not been met, and the

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rejection under 35 U.S.C. §103 should be withdrawn.

## 2. The Combination of References is Improper

Assuming, arguendo, that none of the above arguments for non-obviousness apply (which is clearly not the case based on the above), there is still another, mutually exclusive, and compelling reason why the Lockwood and Kensaku references cannot be applied to reject claim 1 under 35 U.S.C. § 103.

§ 2142 of the MPEP also provides:

*...the examiner must step backward in time and into the shoes worn by the hypothetical 'person of ordinary skill in the art' when the invention was unknown and just before it was made.....The examiner must put aside knowledge of the applicant's disclosure, refrain from using hindsight, and consider the subject matter claimed 'as a whole'.*

Here, neither Lockwood nor Kensaku teaches, or even suggests, the desirability of the combination since neither teaches the particular combination of manufacturing an ultrasound transducer by *providing a plate shaped as a disc and formed of a composite piezoelectric material; cutting the plate to form at least one slit in the plate, the slit includes two facing, oppositely situated free edges which bound the slit; and forming the plate into a hollow spherical cap by deformation, wherein the two facing, oppositely situated free edges which bound the slit are substantially in contact with one another so as to minimize internal stresses in the cap caused by the deformation, as specified above and as claimed in claim 1.*

Thus, it is clear that neither patent provides any incentive or motivation supporting the desirability of the combination. Therefore, there is simply no basis in the art for combining the references to support a 35 U.S.C. § 103 rejection.

In this context, the MPEP further provides at § 2143.01:

*The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.*

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In the above context, the courts have repeatedly held that obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination.

In the present case it is clear that the examiner's combination arises solely from hindsight based on the invention without any showing, suggestion, incentive or motivation in either reference for the combination as applied to claim 1. Therefore, for this mutually exclusive reason, the examiner's burden of factually supporting a *prima facie* case of obviousness has clearly not been met, and the rejection under 35 U.S.C. §103 should be withdrawn.

Accordingly, claim 1 is allowable and an early formal notice thereof is requested.

With respect to claims 2-7 and 10, the claims depend from and add further limitation, in a patentable sense, to allowable claim 1. Accordingly, claims 2-7 and 10 are believed allowable. Claim 11 contains limitations similar to those of claim 1 and is believed allowable for at least the same reasons for allowability of claim 1.

Claims 8 and 9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Lockwood et al. and Kensaku et al. as applied to claims 1-7, 10 and 11 above, and further in view of Chan et al. (6,190,497). Applicant respectfully traverses this rejection for at least the following reasons. Claims 8 and 9 depend from and further limit, in a patentable sense, allowable independent claim 1 and therefore is allowable as well.

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It is clear from all of the foregoing that independent claims 1 and 11 are in condition for allowance. Dependent claims 2-10 depend from and further limit independent claim 1 and therefore are allowable as well.

The amendments herein are fully supported by the original specification and drawing, therefore, no new matter is introduced.

An early formal notice of allowance of claims 1-11 is requested.

Respectfully submitted,



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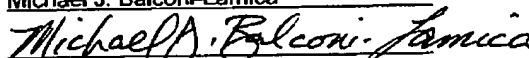
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